



## Modelling mycotoxin formation by *Fusarium graminearum* in maize in The Netherlands

---

**Author(s):** van Asselt ED, Booij CJ, van der Fels-Klerx HJ  
**Year:** 2012  
**Journal:** Food Additives & Contaminants. Part A, Chemistry, Analysis, Control, Exposure & Risk Assessment. 29 (10): 1572-1580

---

### Abstract:

The predominant species in maize in temperate climates is *Fusarium graminearum*, which produces the mycotoxins deoxynivalenol and zearalenone. Projected climate change is expected to affect *Fusarium* incidence and thus the occurrence of these mycotoxins. Predictive models may be helpful in determining trends in the levels of these mycotoxins with expected changing climatic conditions. The aim of this study was to develop a model describing fungal infection and subsequent growth as well as the formation of deoxynivalenol and zearalenone in maize in The Netherlands. For this purpose, a published Italian model was used as a starting point. This model is a mixed empiric-mechanistic model that describes fungal infection during silking (based on wind speed and rainfall) and subsequent germination, growth and toxin formation (depending on temperature and water availability). Model input uses weather parameters and crop management factors, such as maize hybrid, sowing date, flowering period and harvest date. Model parameter values were obtained by fitting these parameters to deoxynivalenol and zearalenone measurements in Dutch maize, using national mycotoxin data from the years 2002-2007. The results showed that the adapted model is capable of describing the trend in average deoxynivalenol and zearalenone levels over these years. Validation with external data is needed to verify model outcomes. It is expected that the current model can be used to estimate the effect of projected climate change on trends in deoxynivalenol and zearalenone levels in the coming years.

**Source:** <http://dx.doi.org/10.1080/19440049.2012.688877>

### Resource Description

#### Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Quality

**Food/Water Quality:** Biotoxin/Algal Bloom

#### Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

#### Geographic Location:

# Climate Change and Human Health Literature Portal



resource focuses on specific location

Non-United States

**Non-United States:** Europe

**European Region/Country:** European Country

**Other European Country :** Netherlands

**Health Impact:**

specification of health effect or disease related to climate change exposure

Other Health Impact

**Other Health Impact:** Mycotoxins

**Model/Methodology:**

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Methodology

**Resource Type:**

format or standard characteristic of resource

Research Article

**Timescale:**

time period studied

Short-Term (